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ABSTRACT

In recent years, broadcast advertisers have become concerned with the tendency of video cassette recorder (VCR) owners to "zap"--fast forward delete--commercials. However, research has shown that viewers retain some recall of commercials, even with fast forward zapping, and it is to the benefit of advertisers to discover ways of increasing that recall through video production techniques. To determine whether certain production elements affected recall, a study was conducted to examine six elements on a variety of viewer responses. The elements studied were camera angle, shot size, cutting rate, background clutter, subject movement, and camera movement. Subjects, 125 college students, viewed seven commercials for nationally advertised products in five different presentations: normal speed, video-only, fast forward standard play, fast forward long play, and fast forward extended play. After viewing, the subjects completed free-recall and aided-recall measures of product type and brand name. Results showed that (1) camera angle affected commercial recall, with normal camera angles or those with extreme degrees of vertical/skew resulting in greater recall, (2) medium shots resulted in better recall than long shots, (3) moderate amounts of cuts resulted in more recall than low or high amounts, (4) background clutter was not negatively related to recall, (5) moderate amounts of subject movement resulted in greater recall than did low or high amounts, and (6) moderate amounts of camera movement did not produce greater recall than did low or high amounts. (FL)

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The Effect of Six Production Variables on Recall of Television Commercials During Fast Forward "Zapping"

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The Effect of Six Production Variables on Recall of Television Commercials During Fast-Forward "Zapping"

In recent years, broadcast advertisers have become increasingly concerned with the tendency for video cassette recorder (VCR) owners to "zap" their commercials. "Zapping" occurs whenever a television viewer deletes a commercial. This deletion can be achieved in a variety of ways including; leaving the room, switching the channel or, in the case of recorded programs, fast forwarding through the commercial (Stengel 1984, Heeter and Greenberg 1985).

Yorke and Kitchen (1985) have found fast forward "zapping" to be "endemic." Other surveys estimate that anywhere from 18 to 64% of VCR owners "zap" commercials (Agostino, Terry and Johnson 1980, Mermigas 1985). With VCR penetration currently at 36% in this country (Descaillleaux 1986) and predicted to rise to 70% by 1990 (Yorke and Kitchen 1985), fast forward "zapping" of television commercials is sure to become a serious problem for television advertisers.

In previous research (White, Evans and Murray 1986), the authors looked at the effect of fast forward "zapping" on the recall of television commercials. Recall of commercials that had been "zapped" was found to be significantly lower than for commercials that were viewed at their normal speed. However, despite the fact that recall was significantly reduced during "zapping," some recall of the brand and product did occur. It was also found that the more familiar the viewer was with the commercial the better recall was whether or not the commercial was "zapped."

The speed at which the commercials had been recorded was also found to make some difference in viewer recall. Normally, consumer model VCRs

in the VHS format can record televised content at three different speeds, standard play (SP, the two hour speed), long play (LP, the four hour speed), and super-long or extended play (SLP or EP, the six hour speed). Commercials recorded in EP and fast forwarded were found to be slightly more memorable than those recorded in SP or LP and fast forwarded (White, Evans and Murray 1986).

Since some recall of television commercials is apparently retained even through fast forward "zapping," it is to the benefit of advertisers and broadcasters to discover a means of maximizing this recall through video production techniques. In the present study, the effects of six elements of video production on commercial recall during fast forward "zapping" were measured. The six production elements chosen for this study were camera angle, shot size, cutting rate, background clutter, subject movement, and camera movement. A method for measuring these six elements in television programming is reported in Padderud (1976).

The effects of several of these video production elements on a variety of viewer responses has been investigated in previous research. In a number of studies, (Tiemens 1970, Mandell and Shaw 1973, McCain, Chilberg and Wakshlag 1971) camera angle has been found to influence perceived credibility of speakers. In general, high angles resulted in increased credibility while low camera angles resulted in higher levels of perceived potency and authority.

In regard to shot size, Williams (1965) found static medium shots maintained throughout a program resulted in approximately the same level of interest as did close-ups and long shots. In another study in 1968, Williams found that long shots tended to decrease attention among viewers. To the extent that interest and attention are related to recall, it is logical to conclude that shot size should have some

effect.

Williams and Debes (1971) found that cutting rate did not influence ratings of interest in televised content. Penn (1971) found that increased cutting rates for human images increased perceived potency and activity. However, too many cuts may interfere with information processing (White 1982).

Research with illustrations found that simple drawings were more effective learning aides than were more complex/realistic pictures (Dwyer 1970), however, Borg and Schyller (1979) found that the complexity of background details in visuals did not affect achievement. Vitz (1966) found that a certain amount of visual complexity was necessary to maintain interest.

While the effect of movement in the video image has not been measured directly, studies have found that filmed or videotaped versions of messages seemed to produce stronger affective responses than did still, printed versions. It may be that camera and subject movement will result in more interest in the message, and that stronger affective responses may yield higher levels of recall. However, too much movement may increase the complexity of the commercials and reduce recall.

Based on previous research, the following hypotheses are suggested:

1. Camera angle will affect recall. It is not possible, however, to predict the direction of this relationship from a review of previous research.
2. Long shots will result in less recall than will close-ups or medium shots.
3. Moderate amounts of cuts will result in more recall than will low or high amounts.
4. The amount of background clutter will be negatively related to

recall.

5. Moderate amounts of subject movement will produce greater recall than low or high amounts.

6. Moderate amounts of camera movement will produce greater recall than low or high amounts.

Procedures

An experiment was designed wherein seven commercials for nationally advertised products were edited between two music videos. The commercials were then shown to groups of viewers in five different presentations. The viewers were 125 college students randomly assigned to a presentation. The five different presentations were:

1. Normal (25 viewers) - the commercials were shown at normal speed with audio intact.

2. Video-Only (19 viewers) - the commercials were shown at normal speed without audio (because audio is cut out in fast forward "zapping").

3. Fast Forward Standard Play, FF SP (32 viewers) - the commercials were recorded in SP and shown fast forwarded.

4. Fast Forward Long Play, FF LP (34 viewers) - the commercials were recorded in LP and shown fast forwarded.

5. Fast Forward Extended Play, FF EP (15 viewers) - the commercials were recorded in EP and shown fast forwarded.

The dependent measures taken indicated recall of product type and brand name measured in two ways. In the Free Recall method viewers were asked to write down the types of products and brand names of any commercials they could remember after viewing the stimulus tape. After attempting to remember in the Free Recall situation, viewers were given a sheet of paper with a list of 10 product types and 30 brand names.

They were told to indicate which products they could recall seeing and to match those products to a brand if they could recall it. This was the Aided Recall measure.

The effect of fast forward "zapping", familiarity, and average tv viewing behavior measured in this experiment have been reported previously in White, Evans and Murray (1986). The present analysis is limited to the effect of the six video production elements in concert with fast forward "zapping." Let it suffice to say that fast forward "zapping" resulted in significantly less recall than did normal or video only presentations, and that the greater the familiarity the greater the recall regardless of whether or not the commercial was "zapped."

Camera Angle

Camera angle was defined as the degree to which the camera was shooting from normal - horizontal and standing human eye-level - perspective. Commercials were coded in two second blocks according to the system reported in Padderud (1976). The codes were summed and an average taken that could range from 0, for the most normal camera angle to 3, for the angle taken with the most extreme degree of vertical skew. Camera angle was then divided into low, moderate and high amounts for analysis purposes. A commercial was placed into the low category when the average camera angle was more than one standard deviation below the mean for all commercials (less than 1.003), moderate when camera angle was within one standard deviation of the mean (1.003 to 1.947), and high when camera angle was more than one standard deviation above the mean (greater than 1.947).

The first hypothesis stated that camera angle would affect recall. A chi-square was performed for camera angle by each of the four dependent variables. Each will be discussed separately.

Free Recall of the Product: The chi-square for free recall of the product was not statistically significant (chi-square = 1.73376, p = .4203).

Free Recall of the Brand: a significant chi-square was found for free recall of the brand (chi-square = 46.3927, $p < .01$). In all 42% of the viewers recall the brand correctly when camera angle was low, 21% recalled the brand correctly when camera angle was moderate, and 46% recalled the brand correctly when camera angle was high.

Aided Recall of Product: a significant chi-square was found for this variable (chi-square = 21.5013, $p < .01$). Eighty-five percent of the viewers recalled the product type correctly when camera angle was low, 66% recalled the product type correctly when camera angle was moderate, and 79% recalled the product type correctly when camera angle was high.

Aided Recall of Brand: a significant chi-square was found for this variable (chi-square = 57.23718, $p < .01$). Eighty-three percent of the viewers recalled the brand correctly when camera angle was low, 44% recalled the brand correctly when camera angle was moderate, and 63% recalled the brand correctly when camera angle was high.

In addition to the chi-square tests, a two factor analysis of variance was performed to see if the presentation (normal, video only, FF SP, FF LP, FF EP) interacted with the effect attributable to camera angle. The four dependent variables were combined into a combination recall score that could range from zero to four correct responses and a two factor ANOVA was performed. A significant interaction was found between camera angle and presentation ($F = 2.289$, $p = .02$, eta^2 for presentation = .0841, eta^2 for camera angle = .0529). Table 1 presents the means relevant to this analysis. Recall scores were significantly

higher in the normal presentation and video only presentations than in the fast forwarded presentations. In all but the FF EP presentation, moderate camera angles produced significantly less recall than did low or high camera angles. There was no difference in recall between the moderate and high camera angles in the FF EP presentation while high camera angle produced significantly more recall.

TABLE 1 ABOUT HERE

Shot Size

Shot size was defined as the size of the image within the frame. Commercials were coded in two second blocks according to the system reported in Padderud (1976). The codes were then summed and an average taken that could range from 0 for a blank screen to 3 for a long shot. Shot size was then divided into low, moderate and high for analysis purposes. Shot size was considered low when it was more than one standard deviation below the mean shot size for all the commercials (less than .555), moderate when it was within one standard deviation of the mean (.555 to 2.463), and high when it was greater than one standard deviation above the mean (greater than 2.463).

The second hypothesis predicted that long shots (or high shot size) would result in less recall than close-ups or medium shots. None of the commercials tested fell into the low category of shot size, so measures are only available for moderate and high shot size. Chi-square tests were performed for each of the four dependent variables by shot size.

Free Recall of Product: a significant chi-square was found for this variable (chi-square = 38.1695, $p < .01$). Thirty-four percent of the viewers correctly recalled the product type when shot size was moderate, and 66% recalled product type correctly when shot size was

high.

Free Recall of Brand: the chi-square test for this variable was not significant (chi-square = 3.37929, $p = .06$).

Aided Recall of Product: a significant chi-square was found for this variable (chi-square = 4.03901, $p = .04$). Seventy-one percent of the viewers correctly recalled the product when shot size was moderate, and 81% correctly recalled the product when shot size was high.

Aided Recall of Brand: the chi-square test for this variable was not significant (chi-square = 1.06963, $p = .30$).

A two factor ANOVA was performed on the combination recall score by the presentation and shot size. Significant main effects were found for both independent variables but no significant interaction. The main effect for shot size ($F = 21.447$, $p = .001$, $eta^2 = .0196$) showed that high shot size resulted in more recall (2.48) than did moderate shot size (1.89).

Cutting Rate

Cutting rate was defined as the number of cuts within a given interval. The commercials were coded in two second segments according to the system reported in Padderud (1976). The codes were summed and an average taken that could range from 0 to 3 for three or more cuts in the interval. Commercials were then coded for low, moderate or high cutting rate for purposes of analysis. Cutting rate was considered low if it was more than one standard deviation below the mean cutting rate for all commercials (less than .385), moderate if it was within one standard deviation of the mean (.385 to 1.42), and high if it was greater than one standard deviation above the mean (more than 1.42).

The third hypothesis predicted that moderate cutting rates would result in more recall than high or low cutting rates. Chi-square tests

were performed for each of the four dependent variables.

Free Recall of Product: a significant chi-square was found for this variable (chi-square = 48.87402, $p < .01$). Thirty-two percent of the viewers recalled the product type correctly when cutting rate was low, 53% recalled the product type correctly when cutting rate was moderate, and 23% recalled the product type correctly when cutting rate was high.

Free Recall of Brand: a significant chi-square was found for this variable (chi-square = 37.37873, $p < .01$). Twenty-two percent of the viewers recalled the brand correctly when cutting rate was low, 44% recalled the brand correctly when cutting rate was moderate, and 22% recalled the brand correctly when cutting rate was high.

Aided Recall of Product: a significant chi-square was found for this variable (chi-square = 17.50741, $p = .0002$). Sixty-six percent of the viewers recalled the product type correctly when cutting rate was low, 81% recalled the product type correctly when cutting rate was moderate, and 67% recalled the product type correctly when cutting rate was high.

Aided Recall of Brand: a significant chi-square was found for this variable (chi-square = 71.96573, $p < .01$). Fifty-one percent of the viewers recalled the brand correctly when cutting rate was low, 72% recalled the brand correctly when cutting rate was moderate, and 34% recalled the brand correctly when cutting rate was high.

A two factor ANOVA was performed on the combination recall score by presentation and cutting rate. Significant main effects were found for both independent variables but no significant interaction. The significant main effect for cutting rate ($F = 29.768$, $p = .001$, $eta^2 = .09$) showed that moderate cutting rates resulted in more recall

(2.4851) than did low (1.7079) or high cutting rates (1.4604).

Background Clutter

Background clutter was defined as the intricacy of the background or area surrounding the subject of the shot. Each commercial was coded in two second segments according to the system reported in Padderud (1976). The codes for background clutter were summed and an average taken that could range from 0 for a blank screen to 3 for a complex background containing a great diversity in contrast and detail. The commercials were coded for high, moderate or low background clutter for the purposes of analysis. Background clutter was considered low when the clutter was more than one standard deviation below the mean clutter for all the commercials (less than .312), moderate when it was within one standard deviation of the mean (.312 to 1.748), and high when it was more than one standard deviation above the mean (more than 1.748).

The fourth hypothesis predicted that the amount of background clutter would be negatively related to recall. Chi-square tests were performed for each of the four dependent variables.

Free Recall of Product: a significant chi-square was found for this variable (chi-square = 54.9035, $p < .01$). Fourty-one percent of the viewers correctly recalled the product type when background clutter was low, 28% correctly recalled the product type when background clutter was moderate, and 58% correctly recalled the product type when background clutter was high.

Free Recall of Brand: a significant chi-square was found for this variable (chi-square = 37.43632, $p < .01$). Fourty-three percent of the viewers correctly recalled the brand when background clutter was low, 22% correctly recalled the brand when background clutter was moderate, and 44% correctly recalled the brand when background clutter was high.

Aided Recall of Product: a significant chi-square was found for this variable (chi-square = 19.0771, $p < .01$). Eighty-five percent of the viewers correctly recalled the product type when background clutter was low, 66% correctly recalled the product type when background clutter was moderate, and 78% correctly recalled the product type when background clutter was high.

Aided Recall of Brand: a significant chi-square was found for this variable (chi-square = 68.10944, $p < .01$). Eighty-three percent of the viewers correctly recalled the brand when background clutter was low, 43% correctly recalled the brand when background clutter was moderate, and 66% correctly recalled the brand when background clutter was high.

A two factor ANOVA was performed on the combination recall score by the presetation and background clutter. Significant main effects were found for both independent variables but no significant interaction. The significant main effect for background clutter ($F = 29.543$, $p = .001$, $eta^2 = .0841$) indicated that moderate levels of background clutter resulted in significantly less recall (1.5842) than either low background clutter (2.5149) or high background clutter (2.4703).

Subject Movement

Subject movement was defined as the amount of movement made by the subject within the frame, subjects could be either people or objects. Each commercial was coded in two second segments according to the system reported in Padderud (1976). The codes for subject movement were summed and an average taken that could range from 0 for no movement to 3 for extreme movement. Commercials were then coded for low, moderate or high subject movement for purposes of analysis. Subject movement in a commercial was considered to be low when it was more than one standard deviation below the mean subject movement for all the commercials (less

than .451), moderate when it was within one standard deviation of the mean (.451 to 2.143), and high when it was more than one standard deviation greater than the mean (greater than 2.143).

The fifth hypothesis predicted that moderate amounts of subject movement would produce more recall than would high or low amounts. Chi-square tests were performed for each of the four dependent variables.

Free Recall of Product: a significant chi-square was found for this variable (chi-square = 46.10273, $p < .01$). Twenty-two percent of the viewers correctly recalled the product type when subject movement was low, 45% correctly recalled the product type when subject movement was moderate, and 20% correctly recalled the product type when subject movement was high.

Free Recall of Brand: the chi-square test for this variable was not significant (chi-square = 5.07725, $p = .08$).

Aided Recall of Product: a significant chi-square was found for this variable (chi-square = 20.41547, $p < .01$). Sixty-six percent of the viewers correctly recalled the product type when subject movement was low, 81% correctly recalled product type when subject movement was moderate, and 66% correctly recalled the product type when subject movement was high.

Aided Recall of Brand: a significant chi-square was found for this variable (chi-square = 54.83258, $p < .01$). Fifty-one percent of the viewers correctly recalled the brand when subject movement was low, 70% correctly recalled the brand when subject movement was moderate, and 37% correctly recalled the brand when subject movement was high.

A two-factor ANOVA was performed on the combination recall score by the presentation and subject movement. A significant interaction was found ($F = 2.347$, $p = .017$, eta^2 for subject movement = .0529, eta^2 for

presentation = .0841). While the normal and video only presentations always produced greater recall than did the fast forwarded presentations; among the fast forwarded presentations, the LP presentation produced the least recall except in the moderate subject movement condition. In that instance the LP presentation produced more recall than did the SP or EP presentations. Table 2 provides the relevant means.

TABLE 2 ABOUT HERE

Camera Movement

Camera movement was defined as the frequency and/or strength of panning, tilting, zooming, or other camera manipulations. Each commercial was coded in two second segments according to the system reported in Padderud (1976). The codes for each commercial were summed and an average taken that could range from 0 for no movement to 3 for extreme movement. The commercials were then coded for low or moderate camera movement for analysis purposes. Camera movement did not vary enough in the commercials sampled to allow division in low, moderate and high. Camera movement was considered low if the code for the commercial fell below the mean (less than 1.286) and moderate if it fell above the mean (greater than or equal to 1.286).

The sixth hypothesis predicted that moderate amounts of camera movement would result in more recall than would low or high amounts. Chi-square tests were performed for each of the four dependent variables.

Free Recall of Product: a significant chi-square was found for this variable (chi-square = 14.78471, $p < .01$). Fourty-one percent of the viewers correctly recalled the product type when camera movement was

low and 21% of the viewers correctly recalled the product type when camera movement was moderate.

Free Recall of Brand: a significant chi-square was found for this variable (chi-square = 18.02001, $p < .01$). Thirty-four percent of the viewers correctly recalled the brand when camera movement was low and 13% correctly recalled the brand when camera movement was moderate.

Aided Recall of Product: the chi-square test for this variable was not significant (chi-square = 3.11304, $p = .08$).

Aided Recall of Brand: the chi-square test for this variable was not significant (chi-square = 2.7936, $p = .09$).

A two factor ANOVA was performed on the combination recall score by the presentation and camera movement. Significant main effects were found for both variables but no significant interaction. The significant main effect for camera movement ($F= 10.863$, $p = .001$, $eta^2 = .0196$) indicated that recall was significantly higher when camera movement was low (2.06) than when camera movement was moderate (1.45).

Summary and Conclusions

The effects of six video production elements on commercial recall during fast forward "zapping" were examined. The first hypothesis was supported by the data; camera angle did appear to affect commercial recall. At all levels of camera angle the "zapped" commercials were not recalled as well as those presented normally or without audio. Camera angles that were either normal or with extreme degrees of vertical skew resulted in greater recall than those with moderate amounts of vertical skew. In the fast forward EP presentation alone there was no difference in recall between camera angles of moderate skew and those of extreme skew. Viewers in the experiment may have found those commercials with extremely skewed camera angles more interesting or memorable, while

normal camera angles may have been easier to interpret. In any event, we recommend that producers of commercials avoid moderately skewed camera angles in favor of normal angles or extremely skewed, "artistic" angles.

The second hypothesis was not supported by the data. Long shots did not seem to have an advantage over medium shots (not enough close-ups occurred in the commercials sampled for that to be examined). In fact it was the medium shots that had the advantage over the long shots, resulting in better recall of product type though not of brand name. This relationship occurred regardless of whether or not the commercial was "zapped." The medium shot may have the advantage of making products more discernable on the television screen, thus leading to greater recall. We recommend that advertisers avoid the use of long shots in commercials.

The third hypothesis was supported by the data. Moderate amounts of cuts did result in more recall of product type and brand name than low or high amounts. This relationship occurred regardless of whether or not the commercial was "zapped." Moderate cutting would be no more than one cut per two seconds in a commercial. This amount seems to keep the commercial optimally interesting and memorable. We recommend that advertisers use no more than one scene change per two seconds in a commercial.

The fourth hypothesis was not supported by the data. Background clutter was not negatively related to recall, instead a curvilinear relationship was found to exist. Moderate amounts of background clutter resulted in less recall than did low or high amounts of background clutter. It may be the case that in cases of high background clutter, viewers ignored the background altogether, while in cases of

moderate background clutter, viewers were trying to process foreground and background. In any event, we recommend that advertisers avoid using moderate amounts of background clutter and keep their videos either very simple or very complex in an "artistic" sense.

The fifth hypothesis was also supported by the data. Moderate amounts of subject movement did result in greater recall than did low or high amounts. This relationship occurred regardless of whether or not the commercial was "zapped," except that, among the fast forwarded presentations, commercials recorded in LP produced less recall than those recorded at other speeds when subject movement was high or low but produced greater recall when subject movement was moderate. Overall, moderate amounts of subject movement seem to maximize recall, therefore, we recommend that advertisers produce commercials in which human subjects exhibit slight movements and objects exhibit manipulation of parts without changing position within the frame.

The last hypothesis was not supported by the data. Moderate amounts of camera movement did not result in greater recall than did low or high amounts. Due to the nature of the commercials sampled, camera movement was only measured at low and moderate levels. In the analyses, low levels of camera movement resulted in significantly better recall for the free recall measures. This relationship occurred regardless of whether or not the commercials had been "zapped." It may be that pronounced camera movements distract the viewer's attention from the product and brand, or, perhaps, pronounced camera movement increases the difficulty of discerning such details. We recommend that advertisers avoid the use of pronounced camera movements. Only slight camera

movements should be employed to keep subjects framed up or to slightly alter the focus of attention in the scene.

The six production variables examined in this study do not constitute an exhaustive list of all the production variables available for manipulation by the advertiser. Other production variables that should be looked at include the positioning of product information on the screen, the visible duration of product information during the commercial, the use of various types of spokespersons, the use of animation and graphics, etc..

Because fast forwarded commercials do not carry the audio track, the focus of the present research is on elements of the video image of the commercial. However, advertisers should not lose sight of the fact that other forms of "zapping" occur in which the audio is the only perceivable portion of the commercial. In these types of "zapping" the viewerrs have shifted their visual attention elsewhere but have not gone far enough away from the television to lose auditory contact. While attempting to maximize the video message for fast forward "zappers," advertisers should also find ways to maximize the audio message for other types of "zappers."

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Table 1

Mean Combination Recall Scores* by Presentation and Camera Angle

	Camera Angle		
	low	moderate	high
Presentation			
Normal	3.12	2.08	3.40
Video Only	2.93	1.95	2.67
FF SP	2.17	1.70	2.026
FF LP	2.412	1.15	2.00
FF EP	1.92	1.43	1.42

* combination recall scores ranged from 0 to 4 correct responses

Table 2

Mean Combination Recall Scores* by Presentation and Subject Movement

	Subject Movement		
	low	moderate	high
Presentation			
Normal	2.120	3.307	2.04
Video Only	2.067	2.756	1.833
FF SP	1.632	2.07	1.763
FF LP	1.088	2.137	1.206
FF EP	1.560	1.587	1.30

* combination recall scores ranged from 0 to 4 correct responses